

SECRET

OKC-3498-63

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20 August 63

MEMORANDUM FOR THE RECORD

SUBJECT : Titanium Structural  
Properties - OXCART

1. Fatigue analyses and tests on the OXCART program are based upon a nominal airplane life of 2300 flight hours including 571 flights, 1071 landings, and 351 refuelings. Detail design and component specimen fatigue test objectives currently underway are to withstand three or more of the specified life spectrums defined above.

2. Fatigue endurance limit characteristics of aged B 120 VCA Titanium at room temperature and at 8000 F are shown on attachment 1. This curve shows the highest stress  $f_{max}$  in thousands of pounds per square inch to which the material can be subjected for a given number of cycles of repetitive loading prior to failure.

3. Other important factors considered in the selection of titanium in addition to weight are its favorable properties in ultimate strength after extended periods at elevated temperature, and resistance to creep which is defined as the maximum stress under which deformation will not exceed a specified value during extended periods at elevated temperatures.

4. The airplane static test program which is nearing completion reportedly indicates that titanium is equal to or exceeding original design expectations. Attachment 2 outlines the basic titanium materials research portion of the program.

SIGNED

Aircraft Systems Division  
(Special Activities)

Attachments 1 and 2

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NO CHANGE IN CLASS.  
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[REDACTED]:ASD/OSA:mvp (20 Aug 63)

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